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THE DYING HICKORY TREES:

CAUSE AND REMEDY.

BY

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Within the past ten years a large percentage of the hickory trees has died in various sections throughout the northern tier of States from Wisconsin to Vermont and southward through the Atlantic States to central Georgia and to a greater or less extent within the entire range of natural growth of the various species.

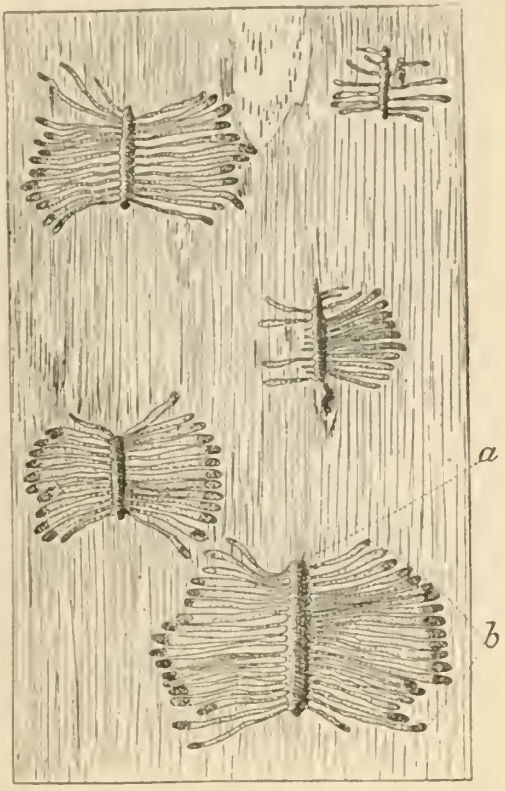

FIG. 1.—Work of the hickory barkbeetle (*Scolytus quadrispinosus*) on surface of wood beneath the bark: *a*, Primary gallery; *b*, larval mines. (Author's illustration.)

CAUSE.

While there are several and sometimes complicated causes of the death of the trees, investigations have revealed the fact that the hickory barkbeetle[1] is by far the most destructive insect enemy, and is, therefore, in the majority of cases, the primary cause of the dying of the trees.

HOW TO RECOGNIZE THE WORK OF THE HICKORY BARKBEETLE.

The first evidence of the presence and work of this beetle is the premature dying or falling of a few of the leaves in July and August, caused by the feeding of the adult or parent

[1] *Scolytus quadrispinosus* Say; Order Coleoptera, family Scolytidæ.

beetles at the base of the leaf stem (fig. 4), but this work alone does not kill the trees.

The next evidence of its destructive work is the dying of part of a tree or of all of one or more trees. If the trees are dying from the attack of the beetle, an examination of the inner bark and surface of

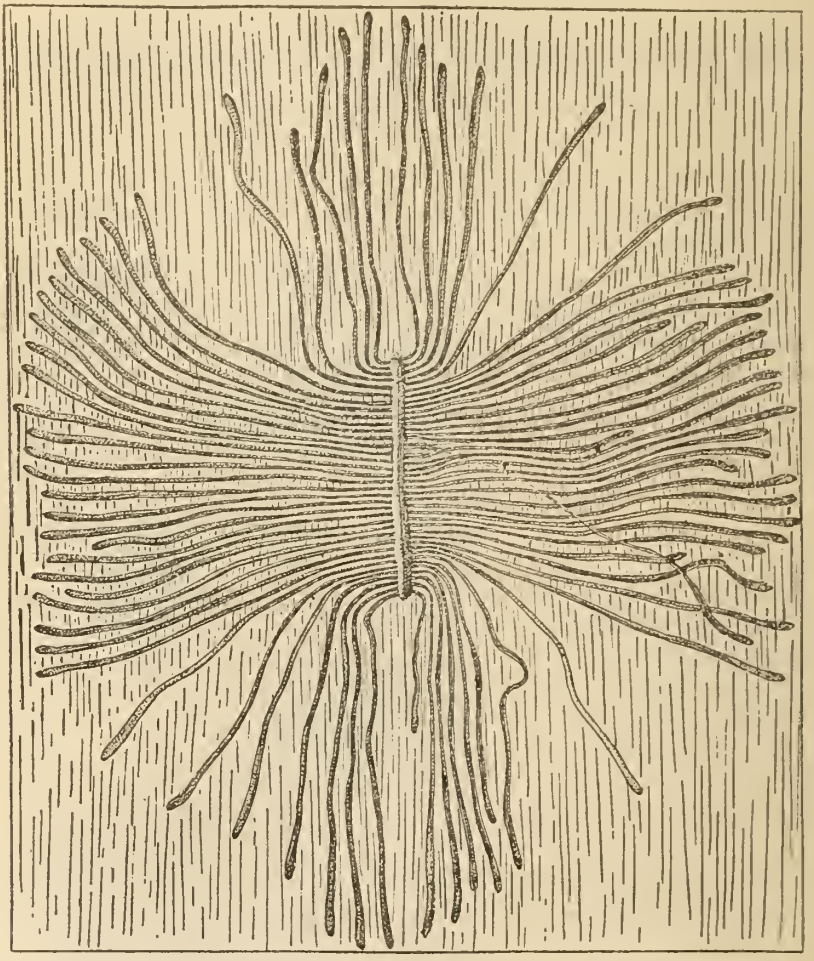

FIG. 2.—Complete brood galleries of the hickory barkbeetle on surface of wood. (Author's illustration.)

the wood on the main trunks will reveal curious centipede-like burrows (figs. 1, 2) in the bark and grooved on the surface of the wood. These are the galleries and burrows of the parent beetles and of their broods of young grubs or larvæ. The girdling effect of these galleries is the real cause of the death of the trees.

HABITS OF THE BEETLE.

The broods of the beetle pass the winter in the bark of the trees that die during the preceding summer and fall. During the warm days of March and April these overwintered broods complete their development to the adult winged form and during May and June emerge through small round holes in the bark (fig. 3) and fly to the living trees. They then attack the twigs (fig. 4) to feed on the base of the leaves and tender bark and also concentrate on the bark of the trunks and large branches of some of the living healthy trees and bore through the bark to excavate their short, vertical egg galleries (fig. 1, *a*). The eggs are deposited along the sides of these galleries and the larvæ hatching from them excavate the radiating food burrows (fig. 1, *b*; fig. 2), which serve to girdle the tree or branch.

FIG. 3.—Exit holes in bark of hickory tree from which broods of the hickory barkbeetle have emerged. (Author's illustration.)

THE REMEDY.

The following recommendations for the successful control of this beetle are based on investigations, experiments, and demonstrations conducted during the past ten years.

RECOMMENDATIONS.

(1) The best time to conduct the control work is between October 1 and May 1, but it must be completed before the 1st to middle of May in order to destroy the broods of the beetle before they begin to emerge.

(2) Locate and mark the hickory trees within an area of several square miles that died during the summer and fall and those of which part or all of the tops or large branches died.

(3) Fell the marked dead trees and cut out all dead or infested portions of the remaining marked trees which still have sufficient life to make a new growth.

(4) Dispose of all infested trunks and branches in such a manner as to kill the overwintering broods of the beetles in the bark (*a*) by utilizing the wood for commercial products and burning the refuse; or (*b*) by utilizing the wood of the trunks and branches for fuel;

or (*c*) by placing the logs in water and burning the branches and tops; or (*d*) by removing the infested bark from the trunks or logs and burning it with the branches or as fuel.

(5) So far as combating the beetle is concerned it is unnecessary and a waste of time to dispose of trees or branches which have been dead 12 months or more, because the broods of the destructive beetle are not to be found in such trees.

FIG. 4.—Injury by the hickory barkbeetle to the twigs, buds, and base of leaves. (Original.)

(6) Spraying the tops or branches or the application of any substance as a preventive is not to be recommended. Nothing will save a tree after the main trunk is attacked by large numbers of this beetle or after the bark and foliage begin to die.

(7) The injuries to the twigs (fig. 4) by this beetle do not require treatment.

(8) The bark and wood of *dying and dead* trees are almost invariably infested with many kinds of bark and wood boring insects

which can do no harm to living trees. Therefore all efforts should be concentrated on the disposal of the broods of the hickory barkbeetle according to the above recommendations.

To insure the protection of the remaining living trees it is very important that at least a large majority of the dead infested and partially dead infested trees found within an entire area of several square miles be disposed of within a single season in order to kill the broods of this beetle. Therefore there should be concerted action by all owners of hickory trees.

On account of the value of the hickory for shade and nuts and for many commercial wood products it is important that the people of a community, county, or State who are in any manner interested in the protection of hickory trees should give encouragement and support to any concerted or cooperative effort on the part of the owners toward the proper control of the hickory barkbeetle.

Approved:

JAMES WILSON,

Secretary of Agriculture.

WASHINGTON, D. C., *November 29, 1911.*

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